User Manual

Hand-held Terminal HTP104

Part Number:	80860.694
Version:	3
Date:	2011-01-14
Valid for:	HTP104

Version	Date	Modifications
1	2006-03-10	First Edition
2	2010-04-09	Interfaces
3	2011-01-14	Technical data

Overall Table of Contents

1 Important Notes

1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER
This symbol is used to refer to instructions which, if ignored or not carefully followed, will result in death or serious injury.

WARNING
This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in death or serious injury.

CAUTION
This symbol is used to refer to instructions which, if ignored or not carefully followed, could result in minor or moderate injury.

NOTICE
This symbol and the accompanying text alerts the reader to a situation which may cause damage or malfunction to the device, either hardware or software, or surrounding property.

Reference to source of information
This symbol refers to detailed sources of information on the current topic.

1.2 Safety Notes

- Read this manual carefully before using the operating device. Keep this manual in a place where it is always accessible to all users.
- Proper transportation, handling and storage, placement and installation of this product are prerequisites for its subsequent flawless and safe operation.
- This user manual contains the most important information for the safe operation of the device.
- The user manual, in particular the safety notes, must be observed by all personnel working with the device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.

1.3 Intended Use

– The device is designed for use in the industry.
– The device is state-of-the art and has been built to the latest standard safety requirements. However, dangerous situations or damage to the machine itself or other property can arise from the use of this device.
– The device fulfills the requirements of the EMC directives and harmonized European standards. Any modifications to the system can influence the EMC behavior.

NOTICE: Radio Interference
This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

1.4 Target Group

All configuration, programming, installation, commissioning, operating and maintenance work in connection with the automation system must be performed by trained personnel only (e.g. qualified electricians, electrical engineers, etc.).

The configuration and programming personnel must be familiar with the safety concepts of automation technology.

The operating personnel must have been trained in handling the controller and be familiar with the operating instructions.

The installation, commissioning and maintenance personnel must have an education which entitles them to work on automation systems.

2 Design and Commissioning

2.1 Unpacking the Device

Unpack all parts carefully and check the contents for any visible damage in transit. Also check whether the shipment matches the specifications on your delivery note.

If you notice damages in transit or discrepancies, please contact our sales department immediately.

2.2 Design

2.2.1 Front View with Dimensions

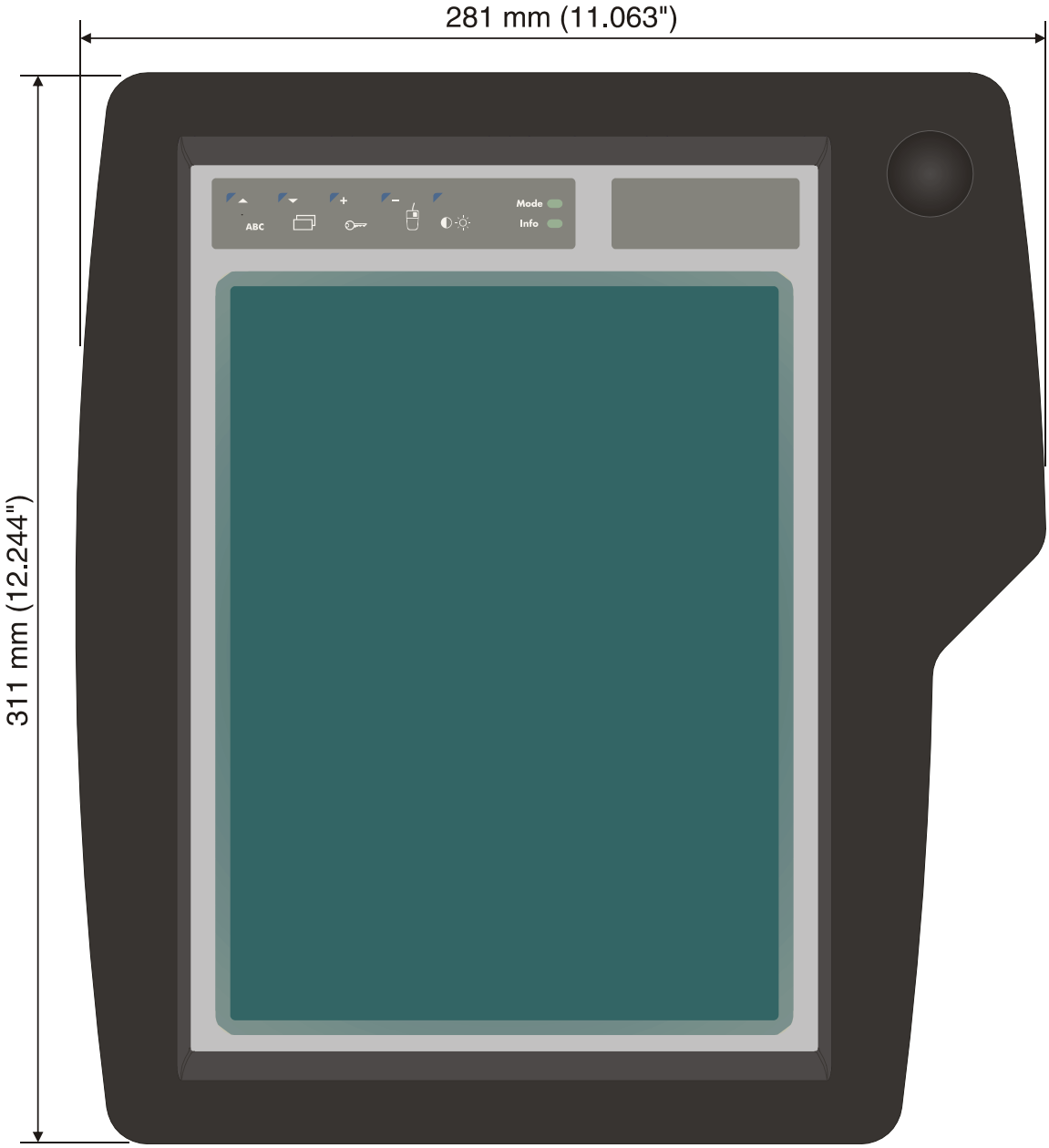


Figure 2-1 Front view with dimensions

2.2.2 Side View with Dimensions

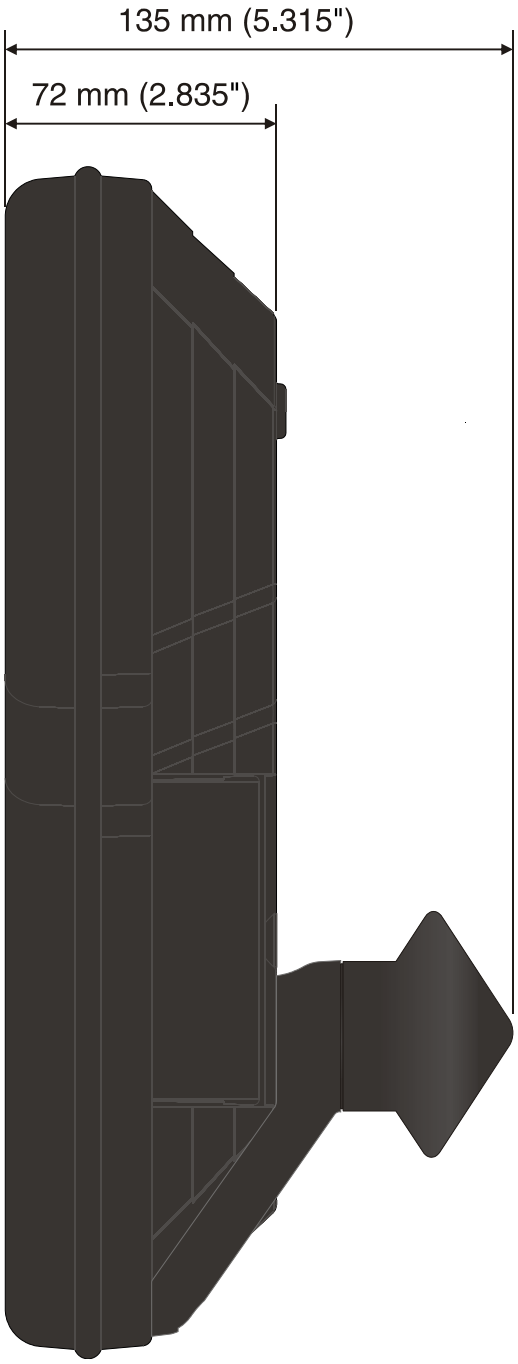


Figure 2-2 Side View with Dimensions

2.2.3 Rear View

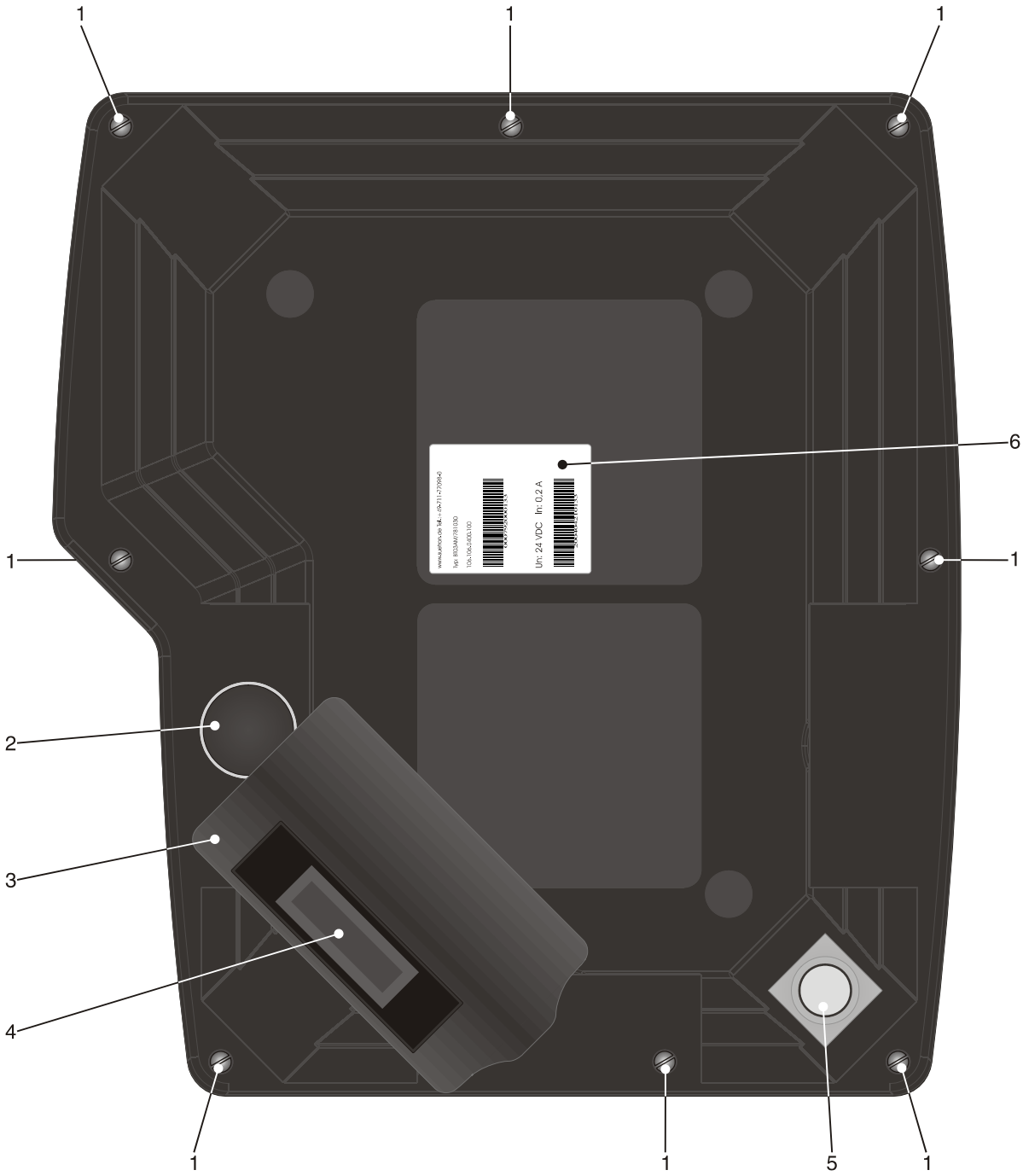


Figure 2-3 Rear view

1 Housing Screws
2 USB (optional)
3 Handle Set (optional - position can vary)
4 Consent Switch (optional - position can vary)
5 Device Connector (optional)
6 Name Plate

2.3 Connecting the Device

DANGER: Hazardous voltages
Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in electric shock!

For information on the pin assignment of the operating device and the terminal box, refer to chapter "Interfaces of the Device".

The device is protected against polarity reversal. The device will not operate if the polarity is incorrect.

This device is in Protection Class I. To ensure safe operation, a safety extra-low voltage (SELV) according to DIN EN 61131 must be used for the supply voltage.

The 19 pin connector is used to connect the operating device with the terminal box. The supply voltage, command devices and Ethernet are connected through the terminal strip of the terminal box.

2.4 Switching On

The Windows CE operating system is installed on the operating device. Running on the operating system is the visualization runtime.

2.4.1 Loading Procedure on Windows CE Operating System

The program allows you to use the buttons to make changes to the configuration.

The operating device has 3 operating modes:

– Normal (no button is pressed)
– Setup Main (Button **Press For Setup Main Menu** was pressed)
– Administration (**Admin** button was pressed)

2.4.1.1 Launch Structure

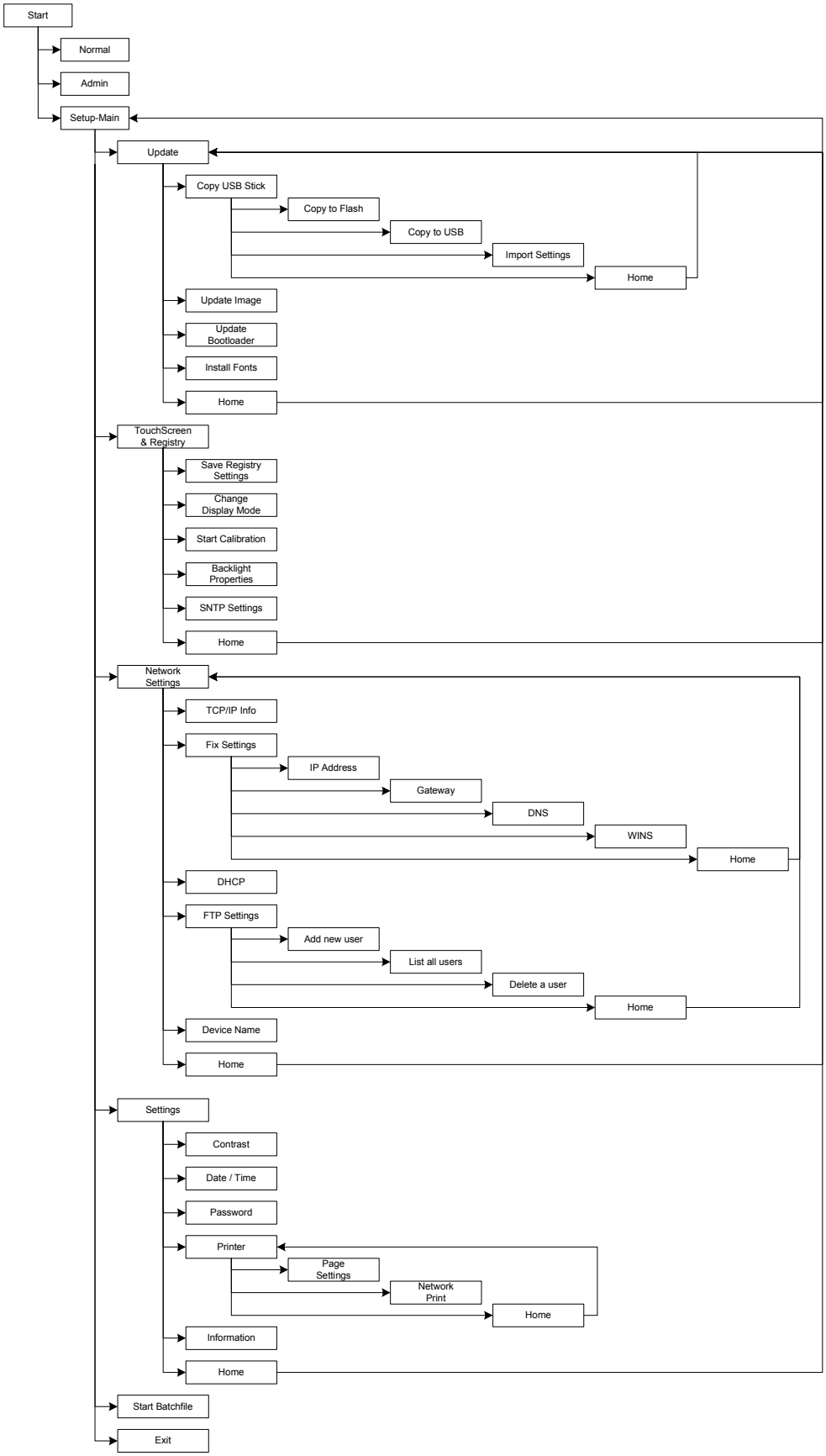


Figure 2-4 Launch structure

2.4.1.2 Normal Mode

The program AppStarter.exe starts from the internal Flash memory.

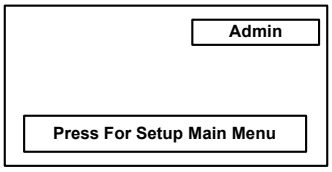


Figure 2-5 Display after startup

Please, note that the device is accessible over the Ethernet only after assignment of an IP address to the Ethernet.

2.4.1.3 Setup Main Mode

If you press the **Press For Setup Main Menu** button during the startup phase, the "Setup Main" mode starts.

Some settings are password-protected. The password is "+-+-".

Update:

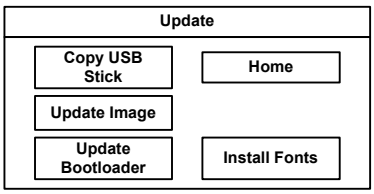


Figure 2-6 Update

Update, Copy USB-Stick:

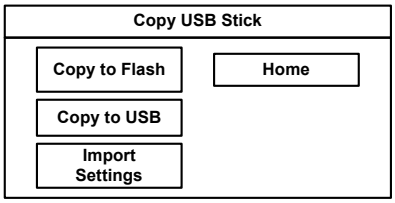


Figure 2-7 Copy USB Stick

Update, Copy USB-Stick, Copy to Flash:

This function copies the data from the USB stick to the internal flash file system.

Several projects can be managed in subdirectories below the directory TSvisRT. If more than one project is in different subdirectories, a choice dialog is displayed. Only directories which contain a project file (*.cb) are listed.

The entire TSvisRT directory or the corresponding subdirectory and the AppStarter.exe are copied into the target directory of the flash file system.

Update, Copy USB Stick, Copy to USB:

Copies the content of the flash file system to the „backup“ directory of the USB stick. This excludes protected system files. A log file is also transferred, which can be used to restore system settings via the „Import Settings“ item.

Update, Copy USB Stick, Import Settings:

An automatically generated log file can be used to restore the system settings. If the „backup“ directory of the USB stick contains a corresponding log file, these settings can be restored.
This is possible only when using identical device types.

Update, Update Image:

If the „image“ subdirectory on the USB stick contains a „*.nb0“ file, this file is used to perform the image update. There must only be one „*.nb0“ file in this directory.
In this case, the flash registry is always deactivated so that the image is processed with a new default registry.

Update, Update Bootloader:

If the „bootloader“ subdirectory on the USB stick contains a „*.nb0“ file, this file is used to perform the bootloader update. There must only be one „*.nb0“ file in this directory.
The user is informed that the update has been successfully completed.

Update, Install Fonts:

If one or multiple fonts are in the subfolder "Fonts" of the flash memory, these will be installed at the start-up of the operating device automatically.

Depending on the number and size of fonts, the system start-up take correspondingly more time.

Touch Screen & Registry:

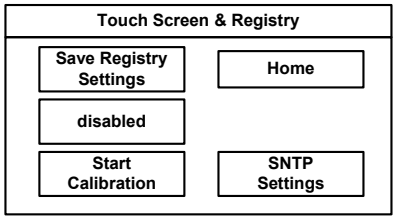


Figure 2-8 Touch Screen & Registry

Touch Screen & Registry, Save Registry Settings:

The entire registry is saved.

Touch Screen & Registry, Change Display Mode:

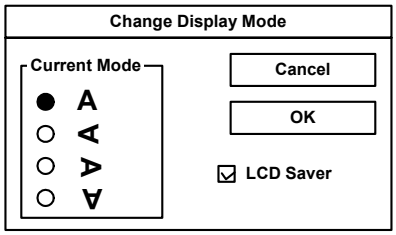


Figure 2-9 Change Display Mode

Set-up of display adjustment.

LCD Saver switches the brightness to the lowest value, if no user operation occures for at least one hour.

This entry is able to be password-protected.

Touch Screen & Registry, Start Calibration:

The touch calibration is started. After the calibration the values are stored automatically in the registry.

Touch Screen & Registry, Backlight Properties:

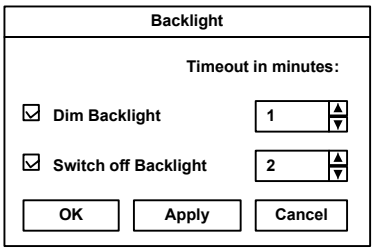


Figure 2-10 Backlight Properties

The brightness of the backlight can be reduced after the defined time (minutes) and turned off in addition.

This entry is able to be password-protected.

Touch Screen & Registry, SNTP Settings:

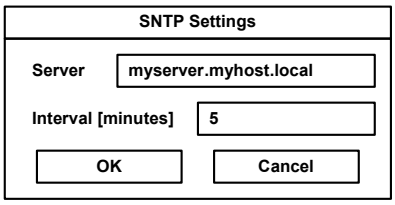


Figure 2-11 Registry, SNTP Settings

You can enter the address of a time server located in the intranet or Internet. The synchronization interval is specified in minutes.

This entry is able to be password-protected.

Network Settings:

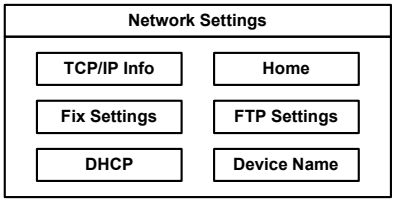


Figure 2-12 Network Settings

Network Settings, TCP/IP Info:

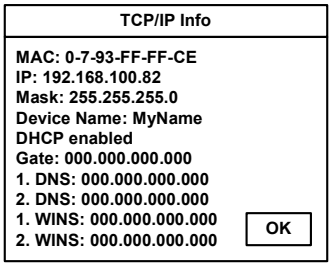


Figure 2-13 TCP/IP Info

The following informations are displayed:

– MAC address
– IP address,
– Subnet mask address,

– Device name,
– DHCP status,
– Gateway address,
– 1. DNS address,
– 2. DNS address,
– 1. WINS address,
– 2. WINS address.

Network Settings, Fix Settings, IP Address:

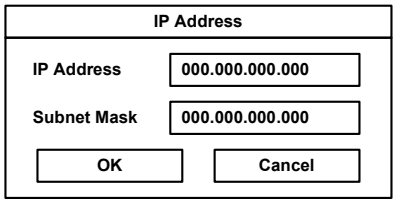


Figure 2-14 IP Address

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
IPAddress=172.016.042.150
SubnetMask=255.255.255.000
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, Gateway:

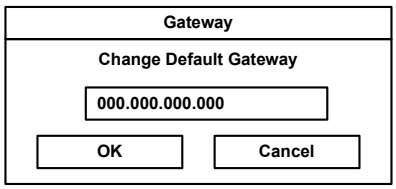


Figure 2-15 Gateway

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
Gateway=172.016.042.150
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, DNS:

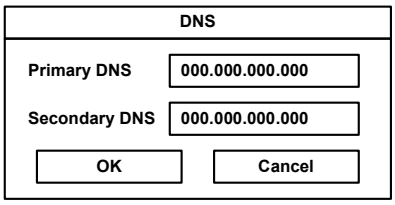


Figure 2-16 DNS

The system deselects DHCP and enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
PrimaryDNS=172.016.042.150
SecondaryDNS=172.016.042.151
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, Fix Settings, WINS:

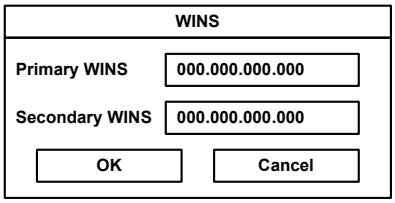


Figure 2-17 WINS

The system automatically deselects DHCP and optionally enters the settings from the IPSetting.ini file of the USB stick. This file must exist in the root directory of the USB stick.
If no USB stick is connected the information is read from the registry.

This entry is able to be password-protected.

Contents of the IPSetting.ini file:

```
[IPCONFIG]
PrimaryWINS=172.016.042.150
SecondaryWINS=172.016.042.151
```

All addresses have to be entered in the format "xxx.xxx.xxx.xxx".
Numbers smaller than 100 have to be filled up with leading zeros.
(e.g.: 192.168.42.1 -> 192.168.042.001).

Network Settings, DHCP:

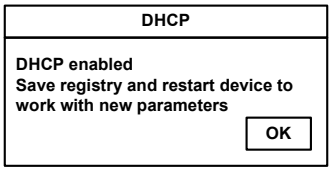


Figure 2-18 DHCP

You may enable DHCP service. You must save this setting when exiting of by using „Save Registry Settings“.

This entry is able to be password-protected.

Network Settings, FTP Settings, Add new user:

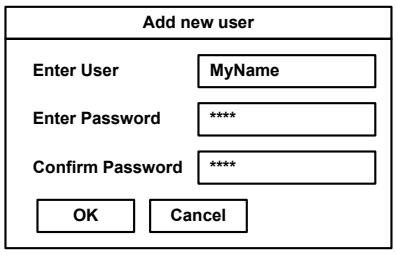


Figure 2-19 Add new user

You may enter a new user name. You have to assign a password to the user name and to confirm it.

If at least one user name is added you cannot login to the FTP server as anonymous anymore.

Network Settings, FTP Settings, List all users:

All users are listed within a DOS box.

Network Settings, FTP Settings, Delete a user:

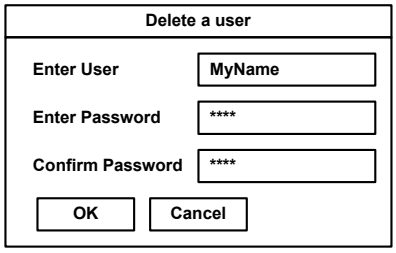


Figure 2-20 Delete a user

You may enter the user name you like to delete.

This entry is able to be password-protected.

Network Settings, Device Name:

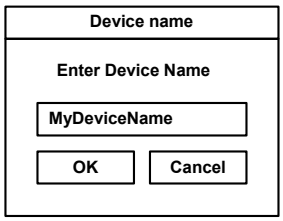


Figure 2-21 Device Name

You can define a device name with up to 14 characters. Via a FTP connection you can access the device with the device name instead of the IP address.

This entry is able to be password-protected.

Settings:

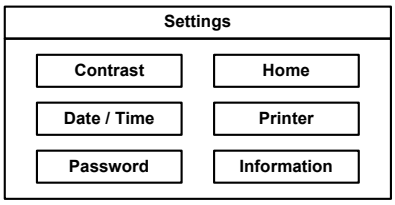


Figure 2-22 Settings

Settings, Contrast:

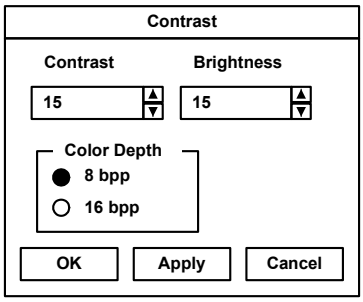


Figure 2-23 Contrast

The operating mode setup main is displayed with default values for contrast and brightness to ensure reading also at faulty values. If you change a value, you have to confirm this in a dialog. If you press **Cancel** or 5 seconds pass without any action the value is not accepted.
Depending on the display type different values can be influenced:

Table 2-1

Display Type	Contrast	Brightness
STN (mono)	X	-
STN (color)	X	X
TFT	-	X

Selection of color depth for TFT displays.

This entry is able to be password-protected.

Settings, Date / Time:

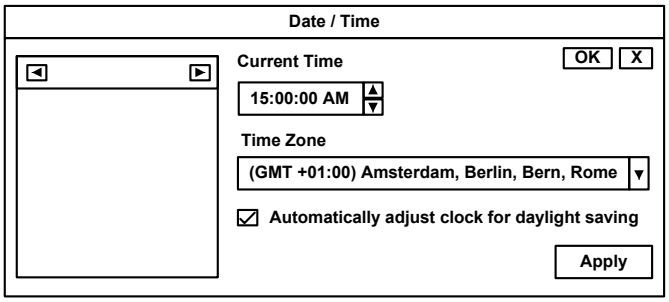


Figure 2-24 Date / Time

Set the date, time and time zone.

Settings, Password:

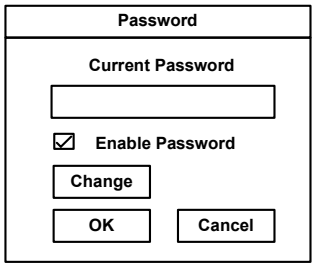


Figure 2-25 Password

The password can be activated, deactivated or redefined. When the password is activated, all password-protected dialog boxes can only be accessed if the password has been entered successfully.

This entry is able to be password-protected.

Settings, Printer:

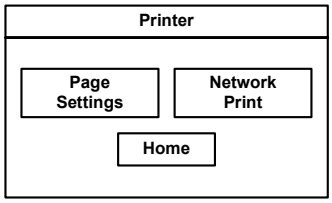


Figure 2-26 Printer

Branching to „Page Settings“ and „Network Print“.

This entry is able to be password-protected.

Settings, Printer, Page Settings:

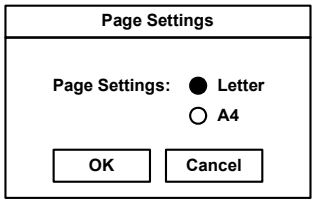


Figure 2-27 Page Settings

Select the paper format, "Letter" or "A4", "Letter" is default.

This entry is automatically stored in the registry.

Settings, Printer, Network Print:

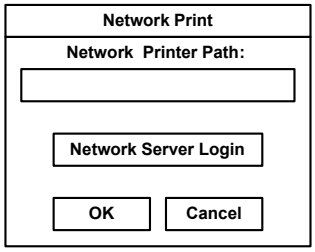


Figure 2-28 Network Print

Enter the network printer path.

This entry is automatically stored in the registry.

Settings, Printer, Network Print, Network Server Login:

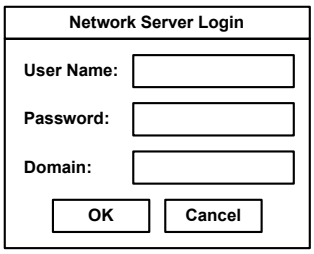


Figure 2-29 Network Server Login

You may perform a network login.

Enter a user name, password and domain.

This entry is automatically stored in the registry.

Settings, Information:

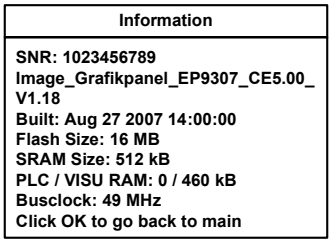


Figure 2-30 Information

The following informations are displayed:

- Serial number,
- Product ID,
- Image version,
- Built version,
- Built date,
- Size of flash,
- Size of SRAM,
- Size of PLC / Visu RAM,
- Bus clock speed.

Start Batchfile:

The **project.bat** file in the **FlashDrv** directory starts, if available.

2.4.1.4 Administration Operating Mode

If you press the **Admin** button during the startup phase, the Administration mode of operation starts.

You can use the Admin.ini file to manage the device. This file must exist in the root directory of the USB stick.

This file is used as a dongle to prevent users from changing the device during normal operation.

Possible contents for the Admin.ini file:

Observe upper and lower case for all entries!

Explorer=Off	Deactivates the Explorer in the registry. The change becomes effective on the next device reboot.
Explorer=On	Activates the Explorer in the registry. The change becomes effective on the next device reboot.
Start=explorer.exe	Starts the explorer
Start=MyProgram.exe	Starts the application MyProgram.exe Initial directory is windows. Use the following syntax to start an application on the usb stick: Start=\\\\HardDisk\\MyProgram.exe Use multiple entries to start several applications.
Registry=Default	Destroys the current registry and activates the default registry of the image. The change becomes effective on the next device reboot.
StartRepllog=On	Enables automatic startup of the Repllog.exe program in the registry. The change becomes effective on the next device reboot.
StartRepllog=Off	Disables automatic startup of the Repllog.exe program in the registry. The change becomes effective on the next device reboot.
LaunchTouch=On	The touch variant of the launch will start at devices with keyboard. The change becomes effective on the next device reboot.
LaunchTouch=Off	The standard variant for the device will start. The change becomes effective on the next device reboot.
Lock=On	The buttons **Press for Setup Main Menu** and **Admin** are disabled. If the file „Admin.ini“ is found on the usb stick the button **Admin** is enabled. Therefore the deactivation of the lock is possible. The change becomes effective on the next device reboot.
Lock=Off	All buttons enabled. The change becomes effective on the next device reboot.
Mode=Development	The shell has full functionality. The change becomes effective on the next device reboot.

Mode=Standard	The Shell is restricted: No task bar and task switch available. Desktop contains the launch icon only. The change becomes effective on the next device reboot.
DeviceName=MyName	Defines the device name of the operating device
;DeviceName=MyName	Comment, no impact

2.5 Identification

The operating device can be identified using the nameplate on the rear of the device.

Figure 2-31 Nameplate (example)

1 Order number
2 Version key (at time of delivery)
3 MAC address
4 Voltage and power specification
5 Serial number

2.5.1 Version Key

The version key provides information on the version level of various components at time of delivery.

3 Control and Display Elements

3.1 Keyboard

The keys are positioned under an environmental-proof polyester foil.

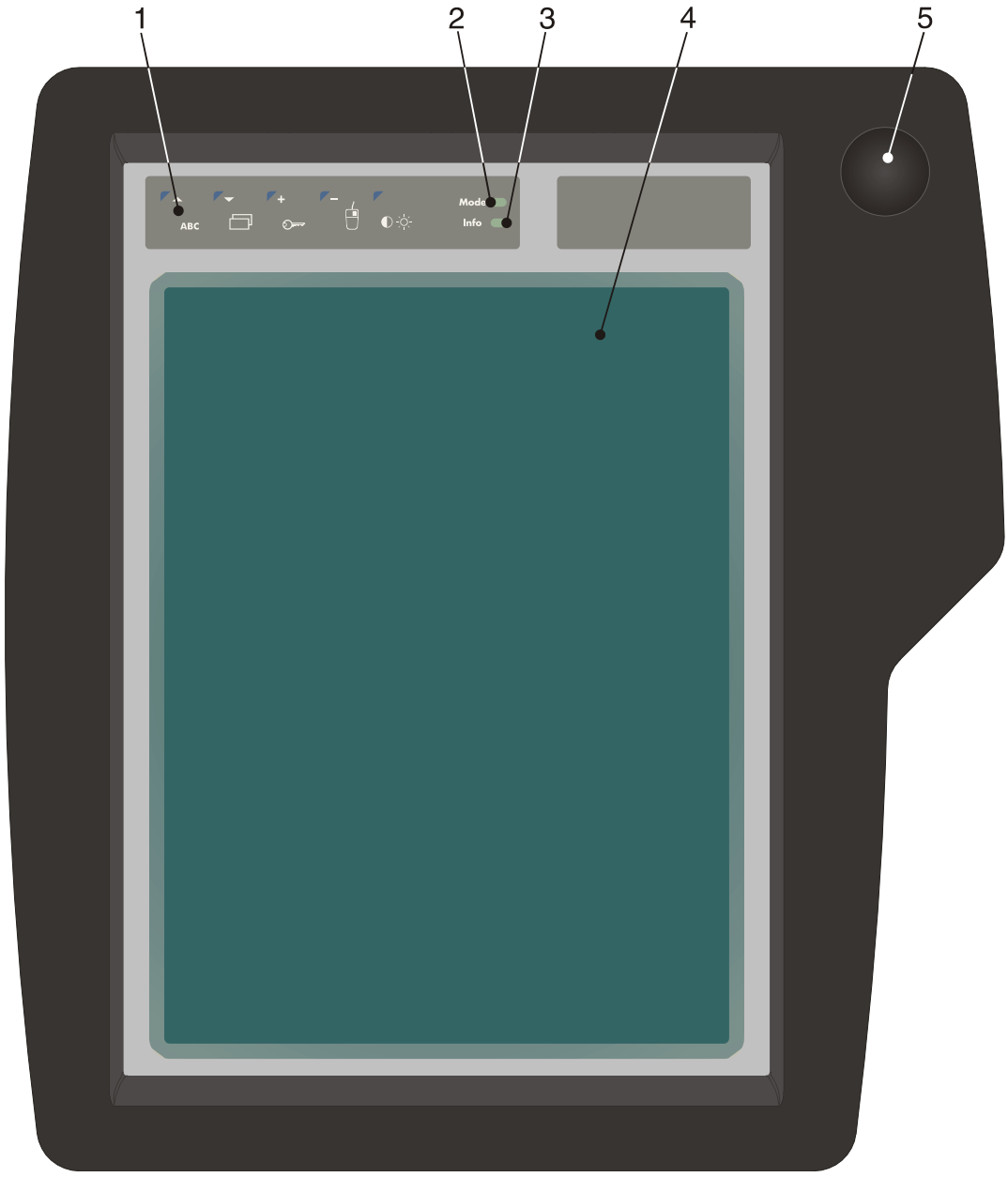


Figure 3-1 Front view

1 Help Keys
2 Status LED Mode
3 Status LED Info
4 Display
5 Command Devices (optional: Emergency Stop Push-button, Stop Push-button, Keylock Switch)

3.1.1 Help Keys

Use this key to show a soft keyboard. To hide the keyboard, press the key again.

Use this key to open the Task Manager in order to change to another task or use this key to close the Task Manager. When you press this key again, the dialog for changing to another task is closed.

Use this key to open the Service tool. To exit the Service tool, press the key again.

Use this key to open the context menu, which can usually be reached by pressing the right mouse button.

To define the contrast / brightness setting, use the key combinations shown below as follows:

To increase the contrast:

To increase the brightness:

To reduce the contrast:

To reduce the brightness:

3.2 Touch Screen

The device is equipped with a resistive 4 wire touch screen. You operate the device using this touch screen.

NOTICE: Damage
Pointed or sharp objects, such as pens or fingernails, can lead to irreparable damages of the touch screen. Exclusively therefore use the fingertips or the aids indicated in the technical data for the operation.

NOTICE: Damage
To protect the touch screen you can use special protection foils. You receive corresponding protection foils directly from Sütron electronic.

3.3 Stop Push-button / Emergency Stop Push-button

The device can be fitted with an optional STOP push-button or an emergency stop push-button.

The STOP push-button on the operating device ensures that the system to be monitored is shut down safely in accordance with EN 60204-1:1997, Paragraph 9.2.5.3. The stop function can be a Category 0, 1 or 2 stop according to EN 60204-1:1997, Paragraph 9.2.2 and must be defined according to the risk assessment.

Therefore, the stop function of the operating device can be used for a safe machine stop as well as for looping into the emergency stop circuit of the system to be monitored.

The signals of the STOP push-button use different circuits in the two versions of the linkbox. In the case of the linkbox with an emergency stop function, the signals control the stop circuit or emergency stop circuit of the system to be monitored. If no hand-held operating device is connected, the stop circuit or emergency stop circuit, respectively, is closed. In the linkbox without an emergency stop function, on the other hand, the signals of the stop circuit or emergency stop circuit are sent via the STOP push-button. If no hand-held operating device is connected, the stop circuit or emergency stop circuit, respectively, of the system to be monitored is open.

The term "stop looping" has the following meaning: The stop circuit or emergency stop circuit, respectively, of the system to be monitored is looped through the linkbox and not interrupted, irrespective of whether the hand-held operating device is connected to the linkbox (and the STOP push-button has not been operated) or not. This functionality is only available with the linkbox with an emergency stop function.

WARNING
If using a hand-held operating device with an emergency stop button, you must ensure that the connecting cable is securely installed.
A hand-held operating device that is not connected to the machine must be stored out of sight of the user!
Bear in mind that the nearest emergency stop will be activated in the event of danger. If it does not work because it is not connected, this could have fatal consequences!

WARNING
If the hand-held operating device is equipped with a STOP push-button but it is not connected to the linkbox, a stop can not be triggered using the hand-held operating device – the STOP push-button of the hand-held operating device is ineffective!
Install stationary emergency stop buttons that are available at all times on the system to be monitored.

WARNING
If the stop circuit has been implemented as a Category 0 or 1 stop, the stop function must be effective regardless of the operating mode. A Category 0 stop must have priority. The releasing of the STOP push-button must NOT lead to hazardous conditions (also see EN 60204-1:1997 Chapter 9.2.5.3).
The stop function is not a substitute for safety devices.

3.4 Consent Switch

The device is fitted with a handle set featuring an integrated 3-step consent switch. Operating sequences can only be performed if the 3-step switch is actuated while set to its middle position. The stop signal is issued when the switch is set to its upper and lower position. After a stop in the lowest position, the release command can only be issued if the switch is fully released and pushed to the middle position again.

Each machine can run in two operating modes, normal mode and special mode. In normal mode (automatic), the machine performs its normal operational tasks. In this mode, safety is provided by closed, isolating protective equipment and/or using active non-isolating protective equipment that blocks access.

The special operating modes of a machine are designed to maintain the normal mode. In this case, safety must be ensured in a different manner than is provided during normal mode because hazardous areas of the machine must be accessed and specific movements must be possible.

In this case, it must be possible to operate the machine at a reduced speed in accordance with the risk assessment, whereby movement is only possible if the consent equipment is actuated simultaneously. The operator must possess the necessary qualifications and training and be familiar with the details of the intended use in accordance with the instruction manual.

The safety-related parts of the controller used to reduce the speed and for the consent equipment must be constructed so that they comply with the EN 954-1 safety category determined on the basis of the risk analysis.

The use of a 2-circuit design for the consent equipment enables compliance with safety category 3 according to EN 954-1:1996. The draft C-standard covering machine tools and processing machinery stipulates the following:
Consent equipment may consist of either a 2-position command unit combined with a stop module or of a 3-position command unit. The use of a 3-position command unit is preferable.

EN 60204 describes the mode of operation of the consent equipment. Based on information gathered from accident research and on the technical solutions currently available, the 3-step consent switch represents state-of-the-art technology. Positions 1 and 3 of the consent switch are "OFF" functions. Only the middle position activates consent. EN 60204-1:1997 is identical to IEC 60204-1, as a result of which the 3-step consent switch is internationally recognized.

The stop category of the consent equipment must be selected on the basis of a risk assessment and must correspond to a Category 0 or Category 1 stop.

WARNING
The consent switch is only suitable for use as a protection function if the person operating the consent switch is able to recognize hazards to personnel in good time and can then immediately initiate hazard prevention measures!
Slower movement speed may also be necessary as an additional measure. The permissible speed must be determined on the basis of a risk assessment.

WARNING
No commands related to hazardous conditions may be initiated by the consent switch alone. A second, conscious start command is necessary (button on hand-held operating device). Only the person operating the consent switch is permitted to be present in the hazardous area.

The following standards must be applied for the risk analysis to be carried out:

- EN 292, General principles for machine design
- EN 1050, Risk assessment of machines

- EN 954-1, Safety-related parts of control systems

These considerations are combined to form a safety category (B, 1, 2, 3, 4) in accordance with EN 954-1, which stipulates the characteristics of the safety-related parts for the system to be monitored.

3.5 Display

DANGER: Toxic
If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

DANGER: Corrosive
If the display is damaged, avoid touching, swallowing or breathing in the liquids or gases which may leak out!

The operating device is equipped with a TFT display.

4 Interfaces of the Device

Depending on the device variant, several interfaces and operating elements are available to you:

Table 4-1 Device variants

Order number	Features							
	Ethernet	USB (internal)	USB (external)	Push-button	Stop push-button	Emergency stop push-button	Keylock switch	Consent switch
HTP104T/12015040/024/02xxx	X	X	-	-	X	-	-	X
HTP104T/12015050/062/05xxx	X	-	X	X	-	X	X	X

4.1 HTP104T/12015040/024/02xxx

The operating device is equipped with a pre assembled 19 pin connector.

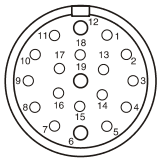


Figure 4-1 Pin diagram for 19 pin connector

The 20 pin connecting cable is constructed of six components.

Table 4-2 Connecting cable

20 Pin Cable	Usage
3 x 0.5 mm²	Supply Voltage
2 x 0.25 mm²	Communication (Shielded)
3 x 0.25 mm²	Communication (Shielded)
5 x 0.25 mm²	Stop Pushbutton / Consent Switch / Command Devices
2 x 0.5 mm²	
5 x 0.25 mm²	

4.1.1 Pin/Cable Assignment

Pin/cable assignment with 19 pin device connector and terminal box.

Table 4-3 Pin/cable assignment

Pin	Wire	Termi-nal	ø mm²	Desig n.	Function
1	BK	9	3 x 0.5	0 V	Supply Voltage 0 VDC
2	VT	11		+ 24 V	Supply Voltage 24 VDC
3	YE	12		⏚	Low-Noise Ground
4	GN	16	2 x 0.25	Tx+	Ethernet
5	RD	15		Tx-	Ethernet
-	GR	-	3 x 0.25	-	Not Connected
11	WH	19		Rx+	Ethernet
18	BN	20		Rx-	Ethernet
7	BU	6	2 x 0.5	Ö	Stop Pushbutton Channel 2
8	BN	1		Ö	Stop Pushbutton Channel 2
6	RDBU	7	5 x 0.25	S	Consent Switch Channel 1
19	WHGN	8		S	Consent Switch Channel 2
9	WHYE	3		Ö	Stop Pushbutton Channel 1
16	BNGN	4		Ö	Stop Pushbutton Channel 1
17	PK	5		S	Consent Switch Channel 2
10	OR	2	5 x 0.25	S	Consent Switch Channel 1
-	WHPK	-		-	Not Connected
-	GRBN	-		-	Not Connected
-	WHGR	-		-	Not Connected
-	YEBN	-		-	Not Connected
13	(Jumper to Pin 14)	-	0.25	-	Detection of operating device in the installation

The specifications in the columns "Pin" and "Wire" apply to the connecting cable/connector on the operating device. The column "Terminal" indicates the assignment of the terminal strip in the terminal box.

4.2 HTP104T/12015050/062/05xxx

4.2.1 Pin/Cable Assignment

Pin/cable assignment with 24 pin male connector and 17 pin connection cable..

Table 4-4 Pin/cable assignment

Pin	Wire	ø mm²	Design.	Function
16	GN	5 x 0,34	0 V	Supply voltage 0 VDC
4	BN		+ 24 V	Supply voltage 24 VDC
Enclosure	YE		⏚	Low-noise ground
5	GR		S	Keylock switch
17	WH		S	Push-button
1	RD	4 x 0,34	Ö	Emergency stop push-button channel 1
13	PK		Ö	Emergency stop push-button channel 1
3	BU		Ö	Emergency stop push-button channel 2
15	BK		Ö	Emergency stop push-button channel 2
6	WHGN	4 x 0,34	S	Consent switch channel 1
18	VT		S	Consent switch channel 1
7	GRPK		S	Consent switch channel 2
19	RDBU		S	Consent switch channel 2
11	YE	4 x 0,15	Tx+	Ethernet
12	GN		Tx-	Ethernet
23	PK		Rx+	Ethernet
24	BU		Rx-	Ethernet
8	BU	Single wire	(Jumper to pin 20)	Detection of operating device
20	BU	Single wire	(Jumper to pin 8)	Detection of operating device
9	BU	Single wire	(Jumper to pin 21)	Detection of operating device
21	BU	Single wire	(Jumper to pin 9)	Detection of operating device
10	-	-	-	Reserve
22	-	-	-	Reserve

5 Maintenance and Servicing

5.1 Maintenance Interval

The following maintenance intervals are recommended for this operating device:

Table 5-1 Maintenance interval

Maintenance work	Interval
Changing the Battery	4 Years

5.2 Front Panel

Only use a damp cloth to remove any dirt from the front panel.

5.3 Fuse

NOTICE: Damage
The semiconductor fuse cannot be replaced!

A semiconductor fuse is used to protect the device. Once the fuse has been tripped, the device must be disconnected from the supply voltage to allow the semiconductor fuse to regenerate. At an ambient temperature of 20 °C (68 °F), the regeneration takes approximately 20 seconds. The higher the ambient temperature, the longer the regeneration takes.

5.4 Battery

The built-in battery supplies the real-time clock. The minimum battery life is 5 years, even under unfavorable operating conditions.

We recommend to change the battery approximately every 4 years as part of the regular maintenance work. A prepared battery including connector can be obtained directly from Sütron electronic.

5.4.1 Changing the Battery

NOTICE: Damage
Batteries must only be changed by authorized and trained experts!

NOTICE: Damage
For changing the battery you may only use replacement batteries of Sütron electronic.

NOTICE: Damage
Electrostatic discharge can damage electronic components. Observe the ESD protective measures!

CAUTION: Explosive
Do not throw lithium batteries into fire, do not heat to 100 °C or higher and do not recharge.

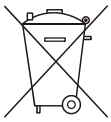
CAUTION: Toxic
Do not open lithium batteries.

NOTICE: Damage
When opening and closing the operating device, you must take care not to damage the seal and make sure that it always sits in the slot provided.

To ensure that the time is preserved, it is possible to change the battery under operating voltage. Please note the safety notes!

1. Remove the screws on the rear of the housing and lift off the housing.
2. Remove the cable fastener which secures the battery.
3. Disconnect the battery connector and remove the dead battery.
4. Plug in the cable for the new battery.
5. Use a cable fastener to attach the new battery to the plastic support.
6. Place the rear panel back onto the device.
7. Carefully screw the screws tightly into the rear panel.

5.4.2 Battery Disposal



The manufacturer is obliged to mark batteries with this symbol before first placing into market. The symbol is extended by the chemical symbols if the following limiting values are exceeded:

More than 0.0005 mass percent mercury	Hg
More than 0.002 mass percent cadmium	Cd
More than 0.004 mass percent lead	Pb

Batteries can be given back free of charge after use at the place of purchase.

According to the §11 of the battery law, final consumers are obligedly to give old batteries back to gathering points which attached to the common take back system or manufacturer-specific take back systems.

NOTICE: Damage
To prevent short circuitry in the collection boxes, insulate the poles of each battery with insulation tape or put each single battery into a plastic bag.

6 Technical Data

6.1 Generally

Display	
Type	TFT (color)
Resolution	800 x 600 Pixels
Colors	65535
Reading Angle	90°
LCD Lifetime	100.000 h
Half-Life Backlighting	50.000 h
Display Area (H x W)	158.5 mm x 211.2 mm (6.240" x 8.315")

Keyboard	
Type	Membrane Keyboard
Number of Keys	5 Help Keys
Key Area (Embossment)	12 mm x 12 mm (0.473" x 0.473")
Actuator Travel	0.6 mm (0.024")
Activation Power	3 N
Switching Cycles	Approx. 3 Million Under the Following Conditions: Keystroke Element: Testing Ram (DIN 42115) Keystroke Load: 10 N Keystroke Frequency: 1 Hz
Display Elements	2 Status LEDs

Touch Screen	
Type	Analog resistive, 4 wire technology
Activation force	15 g (Standard) With R8 HS60 silicon rubber
Durability	No damages or malfunctions after 3 million keystrokes as the following: Keystroke element: R8, HS40 silicon rubber Keystroke load: 150 g Keystroke frequency: 3 Hz

Electrical Data	
Supply Voltage	24 V DC (SELV in Accordance with DIN EN 61131)
Residual Ripple	10% Maximum
Minimum Voltage	19.2 V
Maximum Voltage	30.2 V
Power Consumption (Field Bus Device)	0.7 A
Connected Load	17 W
Fuse	Semiconductor Fuse, Self-resetting
Protection Against Polarity Reversal	Integrated

Central Processing Unit	
Central processing unit	Intel® XScale™ PXA255
Clock frequency	400 MHz

Memory	
Flash (Internal)	32 MByte
SDRAM	64 MByte
SRAM	1 MByte

Ethernet	
Ethernet	10/100 Base-T

Environmental Conditions	
Temperature during operation	0 °C to 50 °C (32 °F to 122 °F)
Temperature during storage, transport	- 25 °C to + 70 °C (-13°F to + 158°F)
Relative air humidity for operation and storage	20 % to 85 %, no condensation
Application area	Degree of pollution 1, overvoltage category II

Standards and Guidelines	
Interference Immunity	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-6-2
Emitted Interference	EN 50011 Limit Class Value A
Equipment Requirements	EN 61131
Storage and Transportation	EN 61131 Part 2
Power Supply	EN 61131 Part 2
Electromagnetic Compatibility	2004/108/EG
Degree of Protection	EN 60529
Impact Load, Shocks	EN 60068 Part 2-27
Sinusoidal Vibrations	EN 60068 Part 2-6
Corrosion Protection	IEC 60068

NOTICE: Radio Interference
This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

Housing	
Type	ROSE Limanda
Material	Polyamide
Impact Resistance	> 7 Nm to DIN 50014
Flammability	V2 to UL94
Degree of Protection	IP65
Total Weight	Approx. 3.2 kg Without Connecting Cable

6.2 Options

Emergency Stop Push-button	
Type	Rafi RAFIX 16
Lifetime	30 000 Switching Cycles
Contact Configuration	Rafi RAFIX 16 Universal Switching Element 2Ö
Switching Element Lifetime	1.000.000
Maximum voltage	24 V AC/DC
Maximum current	1 A

Stop Pushbutton	
Type	Rafi RAFIX 16
Lifetime	30 000 Switching Cycles
Switching Element	Rafi RAFIX 16 Universal Switching Element 2Ö
Switching Element Lifetime	1.000.000
Maximum voltage	24 V AC/DC
Maximum current	1 A

Consent Switch IDEC	
Type	IDEC HE5B
Mechanical Lifetime	Step 1-2-1: 10^6 Switching Cycles Step 1-2-3-1: 10^5 Switching Cycles
Electrical Life	10^5 Switching Cycles
Maximum voltage	24 V AC/DC
Maximum current	1 A

Consent Switch - Jokab	
According to EN 60204-1	
Type	Jokab Safety JSHD4H2
Switching Element	3-Step Switch (2 Channels)
Mechanical Lifetime	>1 Million Switching Cycles (Upper Position to Middle Position) >100 000 Switching Cycles (Middle Position to Lower Position)
Maximum voltage	24 V AC/DC
Maximum current	1 A

Connection System
Cable Connector (CONINVERS; TU Series), 19 Pin, Bayonet
Device Connector (CONINVERS; TU Series), 19 Pin
Male Connector (Harting; HAN24), 24 Pin

Connecting Cable	
Diameter	10.80 +/- 0.35 mm (0.425 +/- 0.014")
Weight	Approx. 172 g/m
Bending Radius	Once: >/= 5 x Cable Diameter Several Times: >/= 12 x Cable Diameter
UL Approved According to Style 20233, 80 °C (176 °F), 300 V	

7 Ordering Data

Table 7-1 Accessories

Description	Part No.
USB 2.0 stick 1 GB	81152.100
Protective foil for touch screen 10,4" (Set with 10 protective foils, scraper and instructions)	81251.104

A Index

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